THE ROLE OF TRUST, HEDONIC AND UTILITARIAN VALUE, AND PRIVACY CONCERN IN THE USE OF VOICE ASSISTANTS ON MOBILE PHONES

Master's Thesis

Mohammadreza Salehmohammadnia

Eskişehir 2023

THE ROLE OF TRUST, HEDONIC AND UTILITARIAN VALUE, AND PRIVACY CONCERN IN THE USE OF VOICE ASSISTANTS ON MOBILE PHONES

MASTER'S THESIS

Program in Business Administration (English)
Mohammadreza Salehmohammadnia
Supervisor: Prof. Dr. Sevgi Ayşe Öztürk

Eskişehir
Anadolu University
Graduate School of Social Sciences
June 2023

FINAL APPROVAL FOR THESIS

This thesis titled "The Role of Trust, Hedonic and Utilitarian Value, and Privacy Concern in the Use of Voice Assistants on Mobile Phones" has been prepared and submitted by Mohammadreza Salehmohammadnia in partial fulfillment of the requirements in "Anadolu University Directive on Graduate Education and Examination" for the Degree of Master of Science in Business Administration Department has been examined and approved on …../…../……...

Committee Members		**Signature**
Member (Supervisor)	: Prof. Dr. Sevgi Ayşe ÖZTÜRK	.....
Member	:	.....
Member	:	.....
Member	:	.....
Member	:	.....

.....

Director

Graduate School of .....

ÖZET

MOBİL TELEFONLARDA SESLİ ASİSTANLARIN KULLANIMINDA GÜVEN, HEDONİK VE FONKSİYONEL DEĞER, VE GİZLİLİK ENDİŞESİNİN ROLÜ

Mohammadreza Salehmohammadnia

İşletme Yönetimi Bilim Dalı (İngilizce) (Tezli) (YL)

Anadolu Üniversitesi, Sosyal Bilimler Enstitüsü, Haziran 2023

Danışman: Prof. Dr. Sevgi Ayşe Öztürk

Yapay zekanın insan yaşamına olan etkisi artmaktadır. Mobil telefonlardaki sesli asistanlar, insan yaşamında derinden etkileyen araçlardan biridir. Tüketiciler, bu teknolojiyle yoğun bir şekilde etkileşim halindedirler. Aslında, sesli asistan, insan ve yapay zeka arasındaki birleşim noktasıdır. Bu alanda birçok teknik araştırma yapılmış olmasına rağmen sesli asistan ve yapay zeka karşısında müşteri davranışları daha az araştırılmıştır. Sonuç olarak işletmelerin ve geliştiricilerin bu teknoloji karşısında müşteri davranışları alanında bilgi ve birikim kazanmaları önemlidir. Mevcut araştırma, cep telefonlarında sesli asistanların kullanımında güven, hedonik ve faydacı değer ve mahremiyet endişelerinin rolünü araştırmayı amaçlamaktadır. Geliştirilen anket formu çevrimiçi ve yüzyüze aracılığıyla 267 kişi tarafından doldurulmuştur.Verilerin analizinde SPSS yazılımının 22. versiyonu kullanılmıştır. Elde edilen bulgulara göre, tüm değişkenler sesli asistan kullanımı üzerinde anlamlı bir etkiye sahiptir. Tüm değişkenler arasında, sesli asistan kullanma niyetinde fayda odaklılık en büyük etkiye sahiptir. Ayrıca, sonuçlara göre, sesli asistanın popülerliği tüketiciler arasında yüksek olmasına rağmen, kullanımın sürekliliği ve sıklığı oldukça düşüktür. Demografik veri analizi sonuçlarına göre, yüksek eğitimli bireylerin sesli asistanı en çok kullandığı görülmektedir, bu da pazar bölümlemesi için işletmeler tarafından kullanılabilecek bir fırsat olabilir.

Anahtar Kelimeler: Yapay zeka, Sesli asistan, Müşteri davranışı, Kullanım niyeti

ABSTRACT

THE ROLE OF TRUST, HEDONIC AND UTILITARIAN VALUE, AND PRIVACY CONCERN IN THE USE OF VOICE ASSISTANTS ON MOBILE PHONES

Mohammadreza Salehmoahammadnia

Department of Business Administration

Anadolu University, Graduate School of Social Sciences, June 2023

Supervisor: Prof. Dr. Sevgi Ayşe Öztürk

The influence of artificial intelligence on human life is growing, and voice assistants on mobile phones are one of the tools that penetrate deeply into human life. Consumers are becoming increasingly engaged with it. In other words, a voice assistant is the interface between humans and artificial intelligence. Several technical studies exist on the topic, but consumer attitudes toward voice assistants and artificial intelligence have received little attention. Therefore, it is essential for businesses and developers to acquire knowledge of consumer behavior toward these technologies, rather than technical knowledge. This study aims to investigate the role of trust, hedonic and utilitarian value, and privacy concerns in the use of voice assistants on mobile phones. Using two types of online and paper questionnaires, 267 respondents completed the survey. Additionally, using quantitative methods, version 22 of the SPSS software was used to analyze the collected data. According to the findings, all variables have a significant impact on the utilization of voice assistants. Among all of the varieties, utilitarian benefit has the greatest impact. In addition, the results indicate that despite the popularity of voice assistants among consumers, their, consistency and frequency of use is remarkably low. Furthermore, according to the results of an analysis of demographic data, the most frequent voice assistant users are highly educated consumers, which can be beneficial for businesses and organizations at the segmentation stage.

Keywords: Artificial Intelligence, Voice Assistants, Consumer Behavior, Intention to Use

25.07.2023

ETİK İLKE VE KURALLARA UYGUNLUK BEYANNAMESİ

Bu tezin bana ait, özgün bir çalışma olduğunu; çalışmamın hazırlık, veri toplama, analiz ve bilgilerin sunumu olmak üzere tüm aşamalarında bilimsel etik ilke ve kurallara uygun davrandığımı; bu çalışma kapsamında elde edilen tüm veri ve bilgiler için kaynak gösterdiğimi ve bu kaynaklara kaynakçada yer verdiğimi; bu çalışmanın Anadolu Üniversitesi tarafından kullanılan "bilimsel intihal tespit programı"yla tarandığını ve hiçbir şekilde "intihal içermediğini" beyan ederim. Herhangi bir zamanda, çalışmamla ilgili yaptığım bu beyana aykırı bir durumun saptanması durumunda, ortaya çıkacak tüm ahlaki ve hukuki sonuçları kabul ettiğimi bildiririm.

.....

(İmza)

Mohammadreza Salehmohammadnia

(Öğrencinin Adı Soyadı)

25.07.2023

STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with "scientific plagiarism detection program" used by Anadolu University, and that "it does not have any plagiarism" whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

…….....

(Signature)

Mohammadreza Salehmohammadnia

(Name and Surname of the Student)

ACKNOWLEDGEMENT

I want to express my appreciation to my advisor, Prof. Dr. Sevgi Ayşe Öztürk, more than anything for her advice, patience, and support throughout my research process. Moreover, I would like to express my thanks to her, as she has been a constant source of help and encouragement for me.

I owe a debt of appreciation to my parents for giving me with the best possible support, love, and opportunities.

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

1.1. Problem

In recent years, the number of people who rely on their mobile phone devices for both personal and business-related duties has increased, which has led to the rise in popularity of virtual assistants, known as VAs. Therefore, it is essential to learn what factors influence consumers' use of virtual assistants on mobile phones.

This study's research problem is to determine the factors that influence consumers' use of virtual assistants (VAs) on mobile phone devices. The most significant concepts that will be investigated under this framework are trust, hedonic and utilitarian value, and concerns around privacy.

1.2. Aim

The purpose of this research is to examine the variables affecting consumers' usage of virtual assistants (VAs) on mobile devices. Trust in brand, hedonic and utilitarian value, and privacy concern are the primary concepts examined here. This study's primary research question is: "What is the relationship between brand trust, hedonic and functional value, privacy concern, and the use of virtual assistants on mobile phones?" Therefore, The goal of this research is to establish whether or not these constructs have a significant impact on the likelihood that consumers are going to use virtual assistants on their mobile phones.

Furthermore, the purpose of this study is to examine the influence of hedonic and utilitarian value on the use of voice assistants on devices. The study will investigate the extent to which voice assistants provide both utilitarian and hedonistic benefits. The research question is: "What is the impact of hedonic and utilitarian value on the use of voice assistants on smartphones?" Therefore, the study will investigate how voice assistants enhance the practical, pleasurable, and convenient aspects of consumers' daily lives.

This study also intends to look into the impact of privacy concerns on the use of virtual assistants on mobile phones. Given the sensitive nature of personal data that may be

shared with VAs, it is essential to understand how privacy concerns may influence the tendency of customers to use them. Consequently, the third research question can be stated as follows: "How do privacy concerns influence consumers' likelihood of using VAs on their cell phones, and what strategies can be employed to mitigate these concerns?"

This study attempts to increase our knowledge of the factors that influence consumers' use of virtual assistants (VAs) on mobile phones.

In light of the above, the following is a list of the research questions that will be addressed in this study:

- What is the level (frequency) of use of voice assistants?
- What is the effect of privacy concerns on the intention to use?
- How do utilitarian and hedonic values affect the use of voice assistants?
- Is trust and privacy concern correlated (when trust increases, does privacy concern decrease)?
- What is the effect of demographic variables on the intention to use?
- What is the effect of privacy concern, hedonic and utilitarian value, and trust on the intention to use voice assistants?

1.3. Importance

The destructive and transformative power of technology progress has been more apparent during the last several decades. Artificial intelligence (AI) technologies have undergone significant acceptance and transformation in all facets of contemporary life in the last few years. Virtual assistants represent one of the rapidly expanding categories of artificial intelligence technologies (Flavián et al., 2023), which have grown in popularity on smartphones and other intelligent devices. As these voice assistants grow more commonplace in people's daily lives, it is important for companies and marketing professionals to comprehend the elements that drive customers to use them. Thus, this thesis aims to explore the role of brand trust (trust in device), hedonic and functional value, and privacy concern of voice assistants on smartphones.

The term "artificial intelligence" (AI) is used to describe the capacity of computers to do activities often associated with human intellect. Logic, analysis, and problem solving are only possible when performed by a human brain (Nazir et al., 2023).

Voice assistants are a form of artificial intelligence (AI) that have the ability to understand and respond to vocal instructions. The idea of their design is to offer users a more naturally and instinctive mode of engaging with their technological equipment.

The advent of voice assistants has caused to a transformation in the way in which individuals engage with technology, therefore placing an important impact on customer behavior. The primary usage of voice assistants among consumers is for simpler tasks such as searching for data, listening to music, and call, making them a more practical, efficient, and user-friendly alternative to older methodsVoice-activated digital assistants can also positively affect consumer behavior, with voice assistant recommendations being more influential than online consumer reviews (Flavián et al., 2023). However, privacy and security concerns continue to be a significant barrier to the widespread adoption and use of voice assistants. On the other hand, trust plays an important role in voice assistant usage. And it should not be overlooked that hedonic and functional value play a significant role in voice assistant usage. Therefore, learning the behavior of consumers in utilizing voice assistants is essential for businesses seeking to exploit this technology to enhance customer experience and engagement.

1.4. Limitations

First, this study was limited to mobile phone users who employ voice assistants. Moreover, this study focused mostly at the influence of brand trust, hedonic and functional value, and privacy concerns on the use of voice assistants on mobile phones. However, this study did not examine other variables that may influence the use of voice assistants, such as introversion, extroversion.Therefore, future research may take into account these factors to provide a more complete understanding of the use of voice assistants on mobile phones. Increasing consumer adoption of voice assistants provides businesses with new opportunities and insights. Understanding the impact of brand trust, hedonic and functional value, and

privacy concerns on the use of voice assistants on cell phones is essential for businesses looking for to improve the user experience and interaction by employing this technology.

2. LITERATURE REVIEW

2.1. Artificial Intelligence and Voice Assistants

2.1.1. Description of artificial intelligence

Artificial intelligence has altered global trends in the age of digital technology. This study will analyze some aspects of voice assistants and artificial intelligence in light of their widespread use, including in the field of marketing. Voice assistants benefit artificial intelligent (AI) technology. Therefore, first of all artificial intelligence has to be defined.

According to Graaf and Malle (2017), because people refer human behavior to artificial intelligent agents, people expect definitions using the same conceptual framework used to define human treats. And it should not be dubious to say that looking at humanistic explain can serve as starting point for definition in artificial intelligence (Miller, 2019).

Perhaps there is not an Artificial Intelligence definition agreed by all. Based on Nilsson (2009), AI that is a task dedicated to changing machines and making them intelligent. Here intelligence means the quality that makes an entity to function applicable and with foresight in its environment. Accordingly, many things like; humans, animals, and some kinds of machines are intelligent.

AI is defined as the following by Mary-Anne Williams (2019), who teaches at the University of Technology in Sydney and specializes in social robots;

"*AI is a kind of computer program that can do activities that need intellect from people. An intelligent computer program could be as simple as a chess program or as complicated as a driverless automobile. For instance, an autonomous automobile uses a variety of sensors to determine its location and its surroundings. Speed, position, direction, and 360-degree view are some of them. The "intelligent" computer system controls the*

vehicle by determining, like a person would, when to move the steering wheel and when to accelerate or stop. The subset of AI known as machine learning includes training computer systems to learn by discovering patterns in data. The computer system improves as more data are added. "

According to Toby Walsh (2022) who is a professor of artificial intelligence explains AI as the following: "Whether it's recognizing objects, identifying people in photos, reading lung scans or transcribing spoken Mandarin, if we pick a narrow task like that and we give it enough data, the computer learns to do it as well"

2.1.2. Description of voice assistants

There are a variety of names used to refer for voice assistants; Intelligent Virtual Assistants (IVAs), Conversational Agents, Virtual Personal Assistants, Personal Digital Assistants, Voice-enabled Assistants, Voice Activated Personal Assistants (VAPA), Intelligent Personal Assistants (IPA), Voice AI Assistants, Voice-activated Artificial Intelligence-based Assistants, Smart Speakers, Artificially Intelligent Voice Assistants (AIVA), Voice Assistants (VAs), Artificial Intelligence-based Voice Assistants, Digital Assistants Based on Artificial Intelligence, Digital Assistants, Voice Based Digital Assistant (VBDA), Artificial Intelligence-enabled Assistants. Consequently, when one of these terms is used, the purpose is evident.

According to Tulshan and Dhage (2019), virtual assistant is an advantage in the twenty-first century. It has prepared the path for a new technology in which we may ask machines questions and communicate with IVAs like we do with humans. This new technology captivated almost the whole globe in a variety of ways, such as smart phones, laptops, and PCs.

A few decades ago, the notion that a machine could have a meaningful conversation sounded futuristic. Several consumer-level products built in the past several years have made voice assistants accessible and affordable for daily use, and additional features and platforms are being introduced constantly (Hoy, 2018).

Voice assistant is a piece of software that uses artificial intelligence to receive voice commands and execute them properly (Sikarwar, 2022). As a consequence of expansion of voice-based technologies powered by AI, humans are increasingly interacting with humanoid virtual assistants in their daily lives (McLean et al., 2021). IVAs are digital assistants based on Artificial Intelligence (AI). They are integrated into cellphones (such as Apple's Siri) or Google Home and Amazon's Echo are examples of smart speakers. Intelligent Virtual Assistants IVAs are types of digital assistants that are powered by artificial intelligence (AI). They may be found in smart speakers (like Google Home and Amazon's Echo) or smartphones (like Apple's Siri, for example). These IVAs are able to identify and interpret voice-activated user inquiries, and they respond back using a natural language that permits communication in a manner that is similar to that of a person. IVAs are most often used to enquire about various topics, such as the news, traffic, and the weather; to request the calendar; and to do online searches on many topics. They are capable of playing music, podcasts, and radio, streaming movies, and setting a timer or a reminder, and they might be used to control smart home devices such as turning on and off lights and controlling the heating or cooling system. In addition, the majority of IVAs have capabilities that allow users to create shopping lists, participate in games, or request comical jokes (Wolbers & Walter, 2021).

Alexa, Siri, Cortana, and Google Assistant are the most prevalent and widely used Intelligent Personal Assistants on the market. Academically, they are known as Speech-based Natural User Interfaces (NUI) (López et al., 2017). All of Apple's Siri, Microsoft's Cortana, Amazon's Alexa, and Google's Assistant are examples of software agents that may be used on purpose-built speaker devices or smartphones.

Digital assistants are integrated artificial intelligence systems that support speech (usually called conversation-enabled apps). They are considered to be dynamic systems with the capacity to learn client preferences. These systems employ inputs such as the user's voice, vision (pictures), and contextual information to aid users by answering questions in natural language, providing suggestions, and carrying out activities (Brill et al., 2019).

Voice assistant applications which are software agents on smart phones keep listening in the background for a wake-up word. As soon as a voice assistant recognizes the trigger phrase, it begins recording the user's voice and sending it to a specialized server,

which then reads it and processes it as a command. According to the order, the server will either play the user-requested media, give the voice assistant with the appropriate information to be read back to the user, or execute operations with other related services and devices (Hoy, 2018).

2.1.3. Functions of Voice assistants

Popular AI voice assistants, such as Apple's Siri, Google Assistant, and Amazon's Alexa, are developed and educated to excel in certain areas, such as searching and navigation, and to fulfil precisely defined tasks. The majority of user interactions with AI voice assistants are often task-oriented, such as checking the weather or news, setting alarms or appointments, ordering meals, playing music, etc. Two areas of research have offered information on the interplay between humans and artificial intelligence. One views technologies largely as instruments for performing diverse activities, and technologies must be embraced and used to fulfil their utilitarian purposes. This stream includes the diffusion of innovation theory, the domestication theory, and the more recent theory of six-acceptance-phase model of interactive technologies as theoretical frameworks. However, another line of inquiry proposes that people see technology as social creatures and form personal ties with them. This area of study is largely led by the computers as social agents (CASA) paradigm, upon which a great deal of research has been conducted. The majority of users engage with AI voice assistants primarily for task-oriented purposes, such as monitoring the news or the weather, setting alarms or appointments, placing food orders, playing music, and so on. Numerous studies have shown that the practical use of voice assistants enhances users' job efficiency, life satisfaction, and professional performance (Xu & Li, 2022).

2.1.4. Use of voice assistants in different industries

Several industries and businesses have been significantly impacted by artificial intelligence. However, there are seven important sectors that are pioneering voice AI innovation, including: Quick service, banking and finance, hospitality, IoT, retail, telecommunications, and transportation.

2.1.4.1. Banking

AI in the banking industry is currently covering frontline operations, managing risk, and operations in the back office are examples of critical functional areas. These new technologies are increasingly being used to do more sophisticated tasks, such as credit assessments and fraud detection. Additionally, by offering the ease of remote onboarding for account creation and lending, they help banks better serve their consumers (Theuri & Olukuru, 2022). Regardless of AI's impact on the banking sector, the use of voice assistants for accessing banking or personal financial information and credit card accounts is lower than for other tasks, such as fact-finding.

In the banking business, voice assistants take the form of speech bots. Voice automation in contact centers, social messaging - voice messaging, voice-guided mobile banking applications, and several more tasks are examples of such applications.

2.1.4.2. Hospitality

Current applications of artificial intelligence in travel and tourism include personalization and recommender systems, robots, conversational systems, smart travel agents, prediction and forecasting systems, language translation applications, voice recognition and natural language processing systems, and robots (Theuri & Olukuru, 2022).

2.1.4.3. Quick service restaurant

Voice-activated technology may be utilized for a variety of functions to aid both guests and personnel in the restaurant. Voice-activated devices in a restaurant may improve the efficacy and speed of communication amongst personnel across departments. When supervisors are unavailable, staff employees may access commonly asked questions through smart speakers. Also, smart speakers may be utilized to present all staff with store- or company-wide updates (e.g., at the beginning of a shift). Due to the hands-free nature of the updates, wait staff may continue arranging tables in the dining room while kitchen employees could prepare their workstations or attend to other duties while listening to the updates. This use of voice-activated technology may enable eateries to distribute information quickly and effectively. Smart speakers may alert managers about reservations made by VIP

clients on a particular day, allowing managers to meet these customers or stop by their table for a brief discussion. Voice-activated technology may help increase communication across departments and speed up the dissemination of information during a busy day at a restaurant. Using a proper application programming interface, a chef might alert Alexa or Google Assistant that the restaurant is out of octopus. This information would then be sent to a point-of-sale (POS) system. Thus, voice-activated technology may aid in informing all wait staff that the kitchen is not receiving octopus orders on that day, saving the time required to alert each waiter individually and reducing client waiting time (Berezina et al., 2019).

2.1.4.4. IoT

IoT integration instructions were the third most frequently used category of commands in the Google Home and Amazon Alexa logs. By offering a framework for the administration of IoT devices, both VAs gave consumers the opportunity to extract greater value from other technologies in their homes (Ammari et al., 2019). Voice-activated technology has an interesting use in devices for the visually disabled, enabling them to engage with the environment in ways that were previously impossible. Another is the screen-less wearable, which normally needs a mobile application to present its data to the user; with voice-activated technology, it may reply immediately. Wearables have contributed significantly to increasing public awareness of IoT. With voice-activated technologies, the IoT is growing even more rapidly. Young children of today will not remember a period when automobiles, houses, and other items did not communicate.

2.1.4.5. Retail

With so many exciting new inventions coming online at such a rapid pace, it is crucial for merchants to create new methods to interact with their consumers at each and every touchpoint, every day of their life. However, touchscreens and tactile technology will always have a role in society. Voice-created shopping lists are advantageously shown on a smartphone, tablet, or television screen. Additionally, there is no alternative for physically inspecting a thing before to purchase. In order for this to occur, voice-activated assistants will need to collaborate with current ecommerce systems (hso, 2018).

2.1.4.6. Telecom

One of the main implementers of speech AI solutions in contact and customer service centers is the telecom industry. As early adopters, top telecom firms have realized the capacity of conversational speech AI to deliver quicker, more convenient customer service, resulting in increased customer loyalty. Although leaders in the Telecom industry are focused on creating omnichannel experiences and monetizing their voice AI investment, their first objective is to provide consumers with the highest level of comfort and usefulness (Stephens, 2021). The use of gesture- and voice-controlled gadgets has increased exponentially during the last several years. Mobile phone use surged fivefold from 11.78% in October 2012 to 53.01% in December 2016, surpassing PC usage in October 2016. This increase is a result of the availability of personal assistants. In the majority of studies, spoken conversation systems have been carefully investigated. However, a new generation of voice-activated personal assistants, such as Apple's Siri, Microsoft's Cortana, and Google Now, have just recently become mainstream and popular on mobile devices (Kiseleva & de Rijke, 2017).

2.1.4.7. Transportation

The transportation sector, a massive worldwide income generator that includes airlines, trains, buses, trucks, and rideshares, is using voice AI technology to improve consumer and staff experiences. Voice assistants may give clients with faster, more efficient, and more communicative travel experiences, including hands-free check-ins and status updates on their route. Employees in the trucking and ridesharing sectors are enjoying safer driving and enhanced navigation thanks to voice-enabled cars and in-car gadgets. Travelers are starting to appreciate the benefits of more convenient travel (Stephens, 2021).

2.1.5. Factors effecting the use of voice assistants

Using means-end chain theory and value-centered thinking, a study assessed the advantages and costs which users consider while using VA. Five principles (efficiency, convenience, simplicity of use, reduced cognitive work, and pleasure) and twelve means

goals are considered by users while determining whether or not to use their VA (Rzepka, 2019).

Table 2.1.5. *Fundamental and Means Objectives of Using AI (Rzepka, 2019)*

Fundamental Objectives	
Maximize efficiency	Maximize convenience
Maximize ease of use	Maximize cognitive effort
Maximize enjoyment	
Mean Objectives	
Ensure hands-free and eyes-free use	Minimize speech recognition errors
Maximize naturalness of conversation	Maximize system transparency
Ensure offline functionality	Maximize compatibility
Maximize system adaptation	Maximize trust
Ensure privacy	Maximize social acceptability
Provide visual output for complex tasks	Provide spoken confirmation for complex tasks

As articulated in the research, worries around stolen personal information, financial information, and the perception of assistants listening in on private conversations explain the negative impact of perceived privacy hazards on the usage of the technology. Voice assistants are prevalent in households with two people or less because of the social benefits. This could be because the voice assistant provides an extra social presence, taking the place of a human counterpart in a larger household. Also, the results show that smaller households see the hedonic benefits of the voice assistant (which were not important when household size wasn't taken into account) as a reason to use the technology. So, it's possible that people who live in smaller households might use their voice assistant to have fun and connect with other people. In houses with a higher number of occupants, the social advantages (Social Presence and Social Attraction) that motivate the usage of an in-home voice assistant are impeded by perceived privacy hazards. It is likely that the perceived privacy concerns may exceed the social advantages, provided that other human equivalents are in the family and so satisfy the social demands of an individual without the hazards associated with voice assistant use. In contrast, social and hedonic advantages received from interactions with a

voice assistant by persons living in smaller homes are unaffected by perceived privacy issues (McLean & Osei-Frimpong, 2019).

Both utility and fun have a high favorable correlation with social identification and personification. In addition, utility and playfulness are favorably connected with information search and task performance. Additionally, trust and frequency of use considerably and favorably modify the relationship between voice assistant usefulness and utilization (Malodia et al., 2021). Additionally, anthropomorphism has a part in the behavioral aim of voice assistants and should thus be taken into account (Wagner et al., 2019).

2.2. Trust

2.2.1. The concept of brand trust

The theoretical notion of brand trust is derived from relationship marketing Setyawan and Kussudiyarsana (2015). The concept of consumer trust in marketing literature exhibits an intense connection with consumer perception. According to Assael (1998), Brand trust is a cognitive element that influences behavior. Trust can be classified into two distinct categories, including organizational trust and personal trust (Ekelund, 2003). Therefore, brand trust is an aspect of personal trust.

The preceding discussion leads us to conclude that in the brand domain, trust is the consumer's assurance that the brand will fulfill his or her consumption expectations. This perception is based on two general aspects of the concept: brand reliability and brand intentions with regard to the individual. (Assael, 1998).

The beginning dimension refers to the presumption that the brand possesses the necessary capability to address needs of the consumer. For example, one way in which a company can maintain consumer satisfaction is by providing new products that meet their needs, or by consistently delivering products of high quality. This criteria requires companies to see their brands as expectations of future performance, which must be reliably delivered if they want consumers to have trust in them and return to them in the future (Deighton, 1992).

The second dimension of brand intention is more intangible, due to its affective and emotional foundations (Michell et al., 1998). Considering that the consumer is vulnerable to the actions and decisions of the company in the context of purchasing and consumption, this aspect is concerned with the idea that the company will not exploit the consumer's vulnerability. An instance of such behavior could be the deliberate violation of the commercial commitment that the brand embodies for the consumer or the absence of a proactive approach towards addressing issues faced by the consumer. Therefore, this factor enables consumers to anticipate how the brand will respond to events and circumstances that it has not yet encountered. Following an outline of the different perspectives of brand trust in diverse research contexts and its significance in the realm of branding, the subsequent discourse relates to a clarification trust.

The definition of trust is "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau et al., 1998). Mayer et al. (1995) have proposed a commonly accepted definition of trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other part" (p. 712). Consequently, placing trust in technology exposes users to the possibility of missing promises and obligations (Mcknight et al., 2011).

2.2.2. Trust in technology

Furthermore, it is perceived as "one of the currencies that humans use to accept a technology in their everyday lives" (Dagli, 2018). Previous research has demonstrated the trust influences users' intention to use novel technologies and that trust relates to technology adoption. In other words, the concept of trust can be defined as an individual's inclination to accept and rely upon a particular matter, situation, or piece of knowledge. (Perez Garcia & Saffon Lopez, 2018). And this is when trust is of particular significance in human-computer interaction, where users must place their confidence on digital agents or virtual assistants to act on their behalf.

Corritore et al. (2003) outlined three pillars that must be established to establish trust. With regard to online compared to offline: ease of use, risk involved, and technology credibility. Sas and Khairuddin (2017) go further, demonstrating that there are two distinct categories of trust among individuals who deal with technology: trust in the technology itself, on the part of users, and trust among individuals who engage with technology.

2.2.3. Trust in voice assistants

Considering Virtual Assistants, trust is most counted, trust established between people and technologies, as it is a one-on-one connection, there is no contact or data exchange with any third parties. Specifically, about this data exchange between the user and an artificial intelligence (AI) technology, permitting a system to be broken down and examined the data is the first move towards establishing trust because it is clear that not all of the information has equal quality and utility.

The overarching objective would be to empower these virtual assistants powered by artificial intelligence to effectively address multiple issues without input from users or monitoring (Falcone & Castelfranchi, 2001). The problem of confidence within consumers and artificial intelligence has been the subject of numerous articles, but little research has been conducted on the essential constructs required for building trust within those parties.

From the standpoint of the common customer, there seems to be a lack of both knowledge of and confidence in artificial intelligence (Hasan et al., 2021). From a theoretical perspective, trust can be perceived in two distinct ways based on the user's level of expertise and familiarity with the subject: intentionally giving private information to a third party, or intentionally exposing oneself to risk by revealing private data (Hasan et al., 2021).

In the case of voice assistants, the existing literature indicates that trust in voice assistants is closely linked to their security features and privacy aspects. The context for supporting VA is extensive, including various components from physical device to cloud for computation, the network that exhibits an inconsistent or unpredictable behavior, to the diverse range of applications developed for said system. Consequently, the matter includes the participation of numerous stakeholders, frequently with intersecting obligations pertaining to safeguarding privacy, accordingly causing the situation intricate. The

identification of stakeholders, their respective responsibilities in enhancing user trust, the identification of pertinent privacy concerns, and the implementation of measures to address security and privacy issues are critical considerations that must be addressed to ensure the success of virtual assistants. (Pal et al., 2020).

In conclusion, trust is crucial to the adoption and utilization of voice assistants. The concept of brand trust, which is derived from relationship marketing, is closely tied to consumer perception and can be broken down into two dimensions: brand reliability and brand intentions. In human-computer interaction, where people depend on digital agents or virtual helpers to carry out their requests on their behalf, trust in technology is particularly important.

The trustworthiness of voice assistants is influenced by factors including ease of use, risk, and technology credibility. In the context of data exchange between users and artificial intelligence (AI) systems, people's trust in technology is crucial. The ultimate objective is to enable AI virtual assistants to manage issues without user input or supervision.

However, the general public lacks both knowledge and confidence in artificial intelligence. Depending on the user's level of expertise and familiarity with the topic, trust can be perceived in two distinct ways: either by voluntarily disclosing private information to a third party or by voluntarily exposing oneself to risk by doing so. Regarding voice assistants, trust is closely related to their security and privacy features.

To ensure the success of virtual assistants, it is essential to identify stakeholders, their respective responsibilities in fostering user trust, and germane privacy concerns, and to implement measures to resolve security and privacy concerns. By addressing these factors, voice assistants can acquire users' trust, resulting in greater adoption and integration into daily life. As a marketing manager, it is crucial to comprehend the role of trust in the use of voice assistants and to develop strategies that promote trust and confidence in the technology, thereby ensuring its market success.

2.3. Hedonic and Utilitarian Values

2.3.1. Definition of hedonic value

Hedonic value refers to the emotional or experiential benefits a product or service offers the consumer (Sağkaya Güngör & Ozansoy Çadırcı, 2022). Consumer satisfaction refers to the positive affective response or enjoyment experienced by a consumer as a result of utilizing a particular product or service (Maubisson & Riviere, 2021). Within the field of voice assistants, hedonic value may be understood as the subjective experience of enjoyment or pleasure that a user derives from utilizing voice assistants on their mobile devices (Brill et al., 2019).

2.3.2. Definition of utilitarian value

The concept of utilitarian value is related to the practical and functional advantages that individuals obtain from a given product or service. The concept is frequently linked to the capacity of a given product or service to meet a specific requirement or address a particular issue. The utilitarian value of a product or service is characterized by its objectivity and quantifiability in terms of its efficiency, effectiveness, and usefulness (Davis, 1989).

2.3.3. Hedonic and utilitarian values in technology products

The concept of hedonic value has been deeply considered in the realm of technology adoption and utilization. According to Maubisson and Riviere (2021) findings, technology products that offer hedonic value, including pleasure, enjoyment, and entertainment, are more likely to be adopted and utilized by consumers. The utilitarian values that stem from an economic framework within the information-processing paradigm are characterized by their usefulness, economic efficiency, and productivity. Conversely, hedonic values are associated with experiences that are enjoyable, pleasurable, and fun. (Kim & Hwang, 2006). Individuals evaluate each given merchandise, services, or technology using two unique criteria: the hedonic or gratification value, which is primarily emotional in nature, and the

utilitarian or instrumental value, which is characterized by a cognitive-intensive approach (Mishra et al., 2022).

The differentiation between hedonic and utilitarian value has been extensively examined within the realm of technology adoption and utilization. Studies have discovered that both hedonic and utilitarian value significantly impact consumers' attitudes, motives, and behaviors regarding technology services and goods (Van der Heijden, 2004).

For instance, researches have indicated that hedonic value plays a significant role in the adoption of technology, as individuals are more inclined to embrace and utilize technological services and products that offer them gratification, delight, and contentment (Venkatesh et al., 2012). On the other hand, utilitarian value of technology has been identified as a significant factor in determining its usage, as consumers tend to persist in using technology-based services and goods that effectively meet their needs and address their concerns.

Smartphones have become a crucial aspect of our daily routines, offering a diverse array of characteristics and capabilities that serve to both hedonic and utilitarian needs (Karjaluoto et al., 2005). The acceptance and application of smart mobile phones by consumers is significantly influenced by hedonic value, which is derived from aesthetics, entertainment, and social aspects. Additionally, the utilitarian value of smart mobile phones, as characterized by their features, functionality, and performance, has been identified as a significant factor in determining consumer satisfaction (Wei, 2008).

Voice assistants, including Siri, Google Assistant, and Alexa, have become a prevalent characteristic of intelligent mobile phones, providing users with a hands-free and natural language interface to engage with their devices.

Voice assistants offer a hedonic value to consumers by providing a hands-free and convenient means of engaging with their mobile devices (Jones, 2019).

In terms of utilitarian value, Voice assistants have the capability to enhance user productivity and device management through streamlined task completion, information retrieval, and hands-free control, thereby obviating the requirement for manual input or navigation. Voice assistants exhibit utilitarian value by enabling users to perform various tasks such as setting reminders, sending messages, conducting web searches, and managing smart home devices through voice commands.

2.3.4. Role of hedonic and utilitarian value on the use of voice assistants

Comprehending the significance of utilitarian and hedonic value in the utilization of voice assistants on mobile devices holds top priority for marketers, developers, and researchers. This knowledge can effectively guide the design, promotion, and assessment of stated technologies. The attitudes, adoption motives, and satisfaction of consumers with voice assistants can be influenced by both utilitarian and hedonic value. Users who attribute significant utilitarian value to voice assistants are more inclined to adopt and utilize these features to enhance their productivity. Conversely, users who attribute significant hedonic value are more likely to engage with voice assistants for amusement or social purposes. Furthermore, the significance of utilitarian and hedonic value could potentially differ based on contextual factors, user attributes, and particular usage scenarios of voice assistants (Malodia et al., 2021).

For example, the prioritization of utilitarian value may be higher among individuals who utilize voice assistants for work-related purposes, whereas the prioritization of hedonic value may be higher among individuals who utilize voice assistants for pleasure or social activities. Through comprehending the significance of utilitarian and hedonic value in the utilization of voice assistants on mobile devices, marketers and developers can customize their approaches to more effectively cater to the requirements and inclinations of their intended demographic, ultimately stimulating the acceptance, involvement, and contentment with these technological innovations.

In conclusion, academics, developers, and marketers need to learn more about the importance of hedonic and utilitarian value in the adoption and usage of voice assistants on mobile devices. When these values are understood, they may be used to inform the development, marketing, and assessment of voice assistant technology. Consumers' perspectives, adoption motivations, and happiness with voice assistants are highly impacted by their utilitarian and hedonic value.

Consumers who are looking for ways to increase their productivity and device management rely heavily on voice assistants because of its utilitarian value, which is shown by these assistants' practical and functional advantages. On the other hand, for users who interact with voice assistants for entertainment or social reasons, hedonic value, which refers

to the emotional or experiential rewards received from utilizing them, is a crucial consideration.

It is possible that elements such as setting, user characteristics, and use cases for voice assistants will influence the relative weight of utilitarian and hedonic value. People who use voice assistants for work-related objectives may place a greater emphasis on utilitarian value, while those who use them for social or recreational purposes may place a greater emphasis on hedonic value.

Marketers and developers can improve their efforts to increase adoption, engagement, and satisfaction with voice assistants on mobile devices by better understanding the significance of utilitarian and hedonic value in the utilization of these technologies. With this knowledge, businesses will be able to create marketing strategies and product upgrades that really connect with customers, propelling voice assistant technology forward in the crowded mobile phone market.

2.4. Privacy Concern

In some literature, privacy risk and privacy concern are used interchangeably, but there is a subtle difference between the two terms. So, the distinction between these concepts will be explored. (Vimalkumar et al., 2021). The concept of privacy risk pertains to the extent of risk that an individual may perceive in relation to the possible exposure of their personal data by users at large.

Even though there are various privacy concerns, scholarly research on privacy risks considers it as a unidimensional concept that depicts the loss of control over private data. Recently, there has been a significant amount of discourse and apprehension surrounding the acquisition and utilization of data by prominent technology companies such as Google, Facebook, and Apple (Agrawal et al., 2018). Consumers have worries about the collection and use of this data out of their approval. Research indicates that the way in which consumers perceive privacy risk, specifically in relation to the secondary usage of their information, can significantly diminish their trust in a website (Martin, 2018). As voice-based assistants are developed and marketed by major technology companies, it is possible that consumers may harbor concerns regarding the potential privacy risks associated with

these advanced technologies (Gardiner, 2018), that may have had an adverse impact on the adoption process.

The issue of privacy concern is analogous to the concept of perceived risk, however, it is the realization of likely harm resulting from exposed personal data (Dinev et al., 2016). The heightened complexity of technological tools utilized for data gathering, retrieval, and analysis has significantly amplified consumer apprehensions regarding privacy. The primary focus of privacy concerns pertains to the acquisition of data, inaccuracies in data, unapproved entrance, and not authorized secondary utilization of the gathered information (Dinev et al., 2016). Privacy concerns are a type of negative behavior that can have a detrimental impact on an individual's attitude towards a particular technology.

Within the framework of VBDA, the end user may articulate a multitude of worries, notably the potential compromise of private personal data, financial data, and other relevant data, particularly in situations where these applications are utilized in a shared environment such as a residential living space.

As an example, the Alexa Dot device is responsive to the instructions of any individual, thereby allowing unrestricted access to the primary user's Amazon shopping list data. Unrestricted access may result in the compromise of personal data, ultimately resulting in financial damage. Numerous empirical studies in the field of e-commerce have confirmed that perceived privacy concern (PPC) has an adverse impact on consumer usage behaviors (Bao et al., 2018; Robinson, 2017).

The issue of privacy concerns has emerged as a highly debated topic (Haug et al., 2020). Xu et al. (2008) has progressed a theoretical framework that suggests that the issue of privacy may arise from either personal traits or circumstantial analysis clues. Research has demonstrated that privacy experiences, including exposure to previous privacy-related incidents, have a substantial influence on a person's privacy issues (Smith et al., 2011). Moreover, the level of privacy awareness, indicating the extent to which individuals are knowledgeable about matters related to privacy, has been found to elicit apprehensions regarding privacy. The study revealed that privacy concerns were influenced by personality and demographic variations, including but not limited to extroversion or introversion, and gender (Bansal, 2017). The privacy computation suggests a risk-reward trade-off, leading to

a particular behavior. In the calculus, privacy risk is described as a person's view of the possible loss of released data to a company (Featherman & Pavlou, 2003).

2.4.1. Privacy concern in artificial intelligence and voice assistants

The potential impact of customers' privacy concerns on their opinions and actions may depend upon the interaction between the characteristics of AI devices, the context of the service, and personal attributes. Therefore, it is essential for both academia and industry to comprehend the complicated nature of consumer privacy concerns in light of recent advancements in AI, while also taking into consideration situational and individual factors. (Hu & Min, 2023).

Artificial Intelligence (AI) is a collection of technologies that involve gathering, processing, analysis, and delivery of useful data. Typically, AI is seen in machines or devices that possess the ability to sense, comprehend, learn, and demonstrate specific facets of human intelligence (Davenport et al., 2020). AI-powered devices can manifest in diverse forms depending on whether they possess a digital presence or a physical embodiment. Artificial intelligence (AI) devices that are frequently utilized in service settings comprise of virtual bots, digital assistants that are integrated into smartphones or tablets such as Apple's Siri, standalone devices such as Amazon's Alexa, and service robots that are either nonhumanoid or humanoid (Buhalis & Moldavska, 2021). These devices have been utilized in various contexts to provide a range of services and meet the demands of customers, spanning from basic functions such as check-in and luggage conveyance to more sophisticated features such as social engagement and companionship.

Despite the utility of these assistants, privacy concerns hinder their widespread adoption (Buhalis & Moldavska, 2021). The primary issue refers to the constant listening attribute of Virtual Customer Digital Assistants (VCDAs), which creates the perception that the technology is persistently working and sending recordings to centralized servers. The second issue relates to the possible abuse of the personal information obtained and handled by businesses or third-party programmers. Apart from the privacy concerns associated with VCDA, certain end users have the mistaken belief that their information is processed on local systems rather than on cloud-based platforms, and that it is not stored. However, it

should be noted that the majority of service providers keep user data for a lifetime (Malkin et al., 2019). Consequently, as a result of insufficient transparency, there usually occurs an uncertainty about the actual handling of data belonging to end users.

In conclusion, privacy concerns and risks have a significant impact on consumer behavior and attitudes relating to voice assistants. It is essential to distinguish between privacy risk and privacy concern, as they represent distinct aspects of the perceived threat to personal data. Personal characteristics, situational signals, and privacy concerns, which can vary among individuals and influence their adoption of voice assistants, influence privacy concerns. In the context of artificial intelligence and voice assistants, the increasing complexity of data collection and analysis technologies has amplified privacy worries among consumers.

Understanding the complex nature of consumer privacy concerns in the quickly transforming AI landscape is crucial for both academia and industry. Understanding complex essence of consumer privacy concerns in quickly transforming AI landscape is crucial for both academia and business. Companies can better modify their offerings and communication strategies to reduce privacy concerns and promote the adoption of voice assistants and AI technologies by considering situational and individual factors. Ultimately, resolving privacy concerns and risks is crucial for the successful integration of AI and voice assistants into consumers' daily routines, ensuring that the benefits of these technologies can be completely realized without jeopardizing the security of personal data.

3. METHODOLOGY

This chapter presents the research methodology. It offers a summary of the research design as well as the methodology. Following this, the data gathering technique will be discussed.

3.1. Research Design

This study's research approach is quantitative in nature. This approach focuses on collecting and analyzing numerical data using statistical methods. This approach was selected because of its capacity to offer exact and objective assessments of the study variables, which is especially useful in marketing research. Using statistical analysis will improve the validity and reliability of the research results, offering for a more in-depth understanding of the subject under examination.

The general availability of mobile phones has led to their common presence in the private as well as public lives of people. With the advancement of technology and the development of artificial intelligence, the trend has strengthened. Voice assistants are one example of this influence. Mobile phones with voice assistants listen for the wake word every second. Therefore, they are always present among people. Overall, the increased popularity of mobile phones and voice assistants has necessitated study on how customers utilize and interact with this technology. Researchers might help companies in developing strategies to improve their products and services and improve the overall user experience by studying the variables that drive customer adoption and use of voice assistants.

3.2. Sampling

The primary objective of this study is to examine consumer behavior related to the utilization of voice assistants on mobile phones. Certainly, young people are the most likely demographic to utilize voice assistants as consumers. As a result, students and university personnel in Iran were selected as the population of the study. Given that samples were

selected from university students and staff, they may represent the population with higher level of education.

Sampling is an essential component of research that involves choosing a subset of people or groups from a larger population (Arsham, 2005). In order to ensure accurate generalization of findings to the population, it is crucial that the sample is representative of population. It is essential to ensure that the sample size is accurately reflecting the population. A sample that is too small may not provide sufficient data to draw reliable conclusions about the population, while a sample that is too large may be time-consuming and costly.

Convenience sampling is used to represent the population in this research. Although convenience sampling does not provide generalization of the findings, the sample chosen will provide insights about the use of the voice assistants in Iran by the university students and the staff. The present investigation's sample consists 267 individuals who were requested to respond to the questions. The study's sample comprised individuals who were selected from the population of university students and personnel.

3.3. Data Collecting and Questionnaire

The development of questionnaires is an important aspect of research since they assist in the collection of vital data and information from participants. The questionnaire used in this study was developed based on previous researches. The questionnaire is divided into three pieces. The first section included questions about mobile phone brand names, voice assistant brand names, and frequency of usage. This section gathered information regarding the participants' preferred mobile phone brand, the sort of voice assistant they use, and the frequency that they use their devices and voice assistants. This section is crucial because it gives insight into the preferences and use patterns of the participants.

In the second section, all of the questions related to variables were developed using a five-point Likert Scale measurement. The use of a Likert Scale enables an improved comprehension of participants' attitudes toward particular variables (Arsham, 2005).

Finally, According to Lietz (2010) to minimize negative attitudes towards providing personal information that may affect response behavior or participation, it is recommended that demographic items like age, education, income, and marital status, be positioned towards questionnaire's end rather than at the beginning. Therefore, participants were asked some demographic inquiries in the third section. Demographic data, including age, gender, level of education, can provide valuable insights into individuals' backgrounds and lifestyles. The table 3.4., provides an illustration of the measurement items in the case of variables.

Table 3.3. *Measurement Items*

Measurement	**Items**
Utilitarian Value Adopted from (McLean & Osei-Frimpong, 2019)	Interacting with a voice assistant is useful. Voice assistant simplifies my life. Voice assistant makes time management easy. Using voice assistant is practical (I don't have to touch the screen). Using the voice assistant enables me to navigate (browse) quickly.
Hedonic Value Adopted from (Jain et al., 2022)	Voice assistant is exciting. Voice assistant is interesting. Interacting with voice assistant is fun. Voice assistant is entertaining. Voice assistant is enjoyable.
Privacy Concern Adopted from (McLean & Osei-Frimpong, 2019)	I am hesitant to conduct a transaction involving money through the voice assistant. My concern is that my confidential information stored by the voice assistant could be hacked. I have become worried that the voice assistant accumulates an excessive amount of data about me.

	I am concerned that voice assistant technology may acquire my personal data without my permission.
Trust Adopted from (Al Shamsi et al., 2022; Fernandes & Oliveira, 2021)	Voice assistants are trustworthy. I think voice assistants are reliable. I believe the virtual assistant provides honest information. I trust my smart phone brand. My smart phone is an honest brand. My smart phone is safe.
Intention to Use Adopted from (Jain et al., 2022)	In the future, I will utilize my voice-based assistant. I plan to utilize my voice-activated assistant often. I plan to continue utilizing the voice assistant as opposed to discontinuing its use.

3.4. Pilot Study

A pilot study was conducted on a group of 10 individuals who were subsequently excluded from the final sample. A few procedures were taken during the pilot study to collect feedback from participants. To begin, participants were instructed to read the complete questionnaire and respond to all questions. Second, they were asked to indicate any questions that were confusing or unclear and needed explanation. Finally, participants were requested to provide suggestions for improving the questionnaire's efficiency and accuracy. The participants' feedback and suggestions were documented. A few changes were made to the questionnaire based on the results of the pilot study. One question was eliminated from the section on intention to use, while two others were revised to promote clarity and understandability for participants. Overall, the pilot study was an important part of the process since it allowed for required changes to be made for best results.

3.5. Data Analyze

The current study divides the data analysis procedure into two parts: descriptive results and findings. To analyze the collected data, descriptive statistics will be provided first in order to assess the variables. The outcomes of the research questions test will then be presented in the findings.

4. FINDINGS

In this research, SPSS 22 Software was used for statistical analysis. A reliability test was applied to ensure that the variables are consistent and dependable. The mean and standard deviation of variables can be seen from Table 4.

Table 4. *Mean and Std. Deviation of variables*

	Privacy Concern	Hedonic Benefit	Utilitarian Benefit	Trust	Intention to Use
N	267	267	267	267	267
Mean	2.64	2.25	2.21	2.70	2.40
Std. Deviation	0.93	0.81	0.71	0.72	0.75

4.1. Reliability

Cronbach's Alpha values of all variables can be observed on the table 5.2. Based on Cronbach's Alpha coefficients, all the variables show high reliability. Reliability of Privacy Concern scale has been found 0.86 which means that the scale is 86% reliable. When it comes to Hedonic Benefit scale, its reliability has been found 0.94 which indicates that scale 94% reliable. With the score of 0.85, reliability of Utilitarian Benefit scale has been found reliable. Trust scale has been measured 0.84 which has been resulted with the 84%. Also, reliability of Intention to Use scale has been found 0.84 which means that scale is 84% reliable.

Table 4.1. *Mean and Std. Deviation of variables*

Variable	Number of Measurements	Cronbach's Alpha	Type
Privacy Concern	4	0.86	Reliable
Hedonic Benefit	5	0.94	Reliable
Utilitarian Benefit	5	0.85	Reliable
Trust	6	0.84	Reliable
Intention to Use	3	0.84	Reliable
Questionnaire	23	0.84	Reliable

4.2. Normality

In order to investigate the normality of the distribution of the variables, Kolmogorov-Smirnov test is used. According to skewness and kurtosis values of our variables including Privacy Concern, Hedonic Benefit, Utilitarian Benefit, Trust and Intention to Use in table 4.2, all variables are distributed abnormally.

Table 4.2. *Kolmogorov-Smirnov Test*

	Privacy Concern	Hedonic Benefit	Utilitarian Benefit	Trust	Intention to Use
Test Statistic	0.092	0.099	0.089	0.110	0.129
Asymp. Sig. (2-tailed)	0.000	00.000	0.000	0.000	0.000

4.3. Characteristics of Respondents

Demographic data is shown in the table 4.3.

Table 4.3. *Demographic Characteristics*

Demographic Characteristics		Frequency	Percent
Gender	Male	124	46.4
	Female	143	53.6
Age	15to20	50	18.7
	21to30	112	41.9
	31to40	79	29.6
	41to50	22	8.2
	51-and-older	4	1.5
Education	High-school	48	18.0
	Associate	20	7.5
	Bachelor	92	34.5
	Master	86	32.2
	PhD	21	7.9
Occupation	Employee	107	40.1
	Freelancer	25	9.4
	Unemployed	25	9.4
	Student	96	36.0

Homemaker	14	5.2

4.3.1. Gender

55.1% of participants were males and 44.9% were females. The results indicate a slightly higher proportion of females than males within the sample population. This feature can be observed from the figure 4.3.1 below:

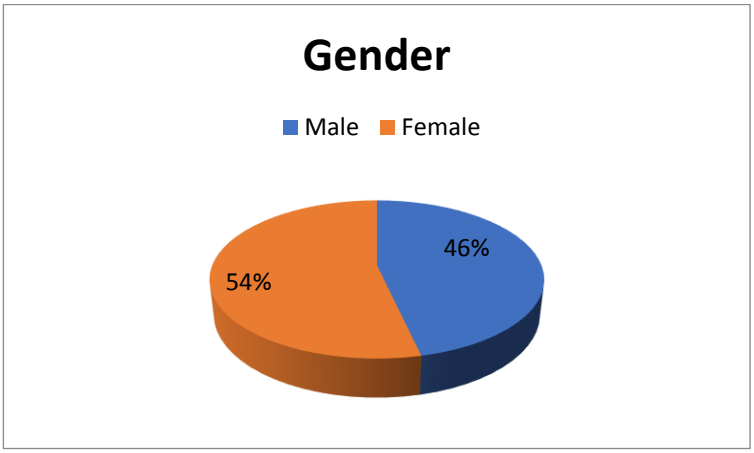

Figure 4.3.1. *Gender*

4.3.2. Age

18.7% of participants were at the age between 15-20 years old and 41.9% were at the age between 21-30 years old. Also, 29.6% of Participants were at the age between 31-40, 8.2% were at the age between 41-50 years old and 1.5% were 51 years old and older. This feature can be observed in figure 4.3.2 below:

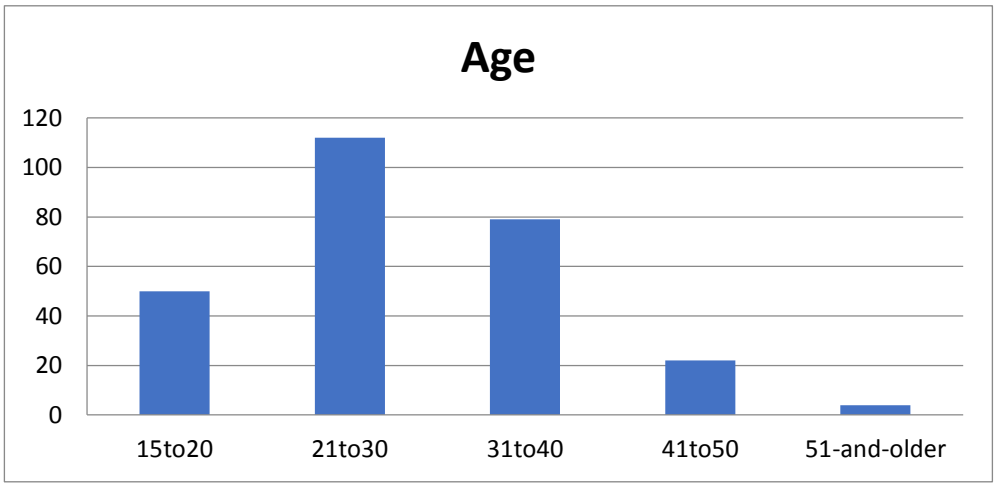

Figure *4.3.2.* *Age*

4.3.3. Education

The majority of the participants (66.8%) hold bachelor's or master's degrees, while 18.0% were in High-school level and 7.5% were Associate. Lastly, 7.9% of the participants hold PhD degree. This feature can be observed in figure 4.3.3. below:

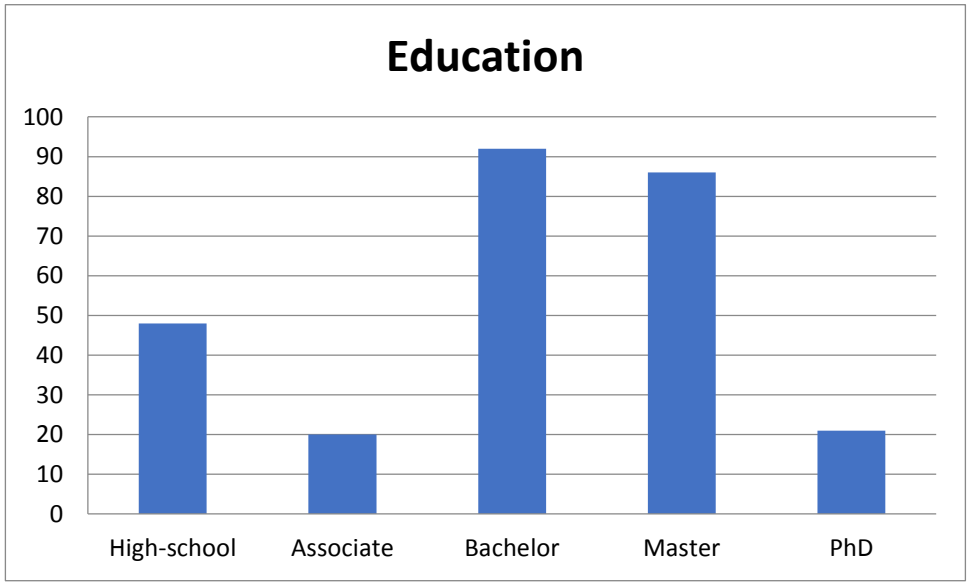

Figure 4.3.3. *Education*

4.3.4. Occupation

The highest percent of the participants were employees (40.1%) and the second highest rate was students (36.0%), while 9.4% of the participants were freelancers, 9.4% were unemployed and 5.2% were homemaker. This feature can be observed in figure 4.3.4. below:

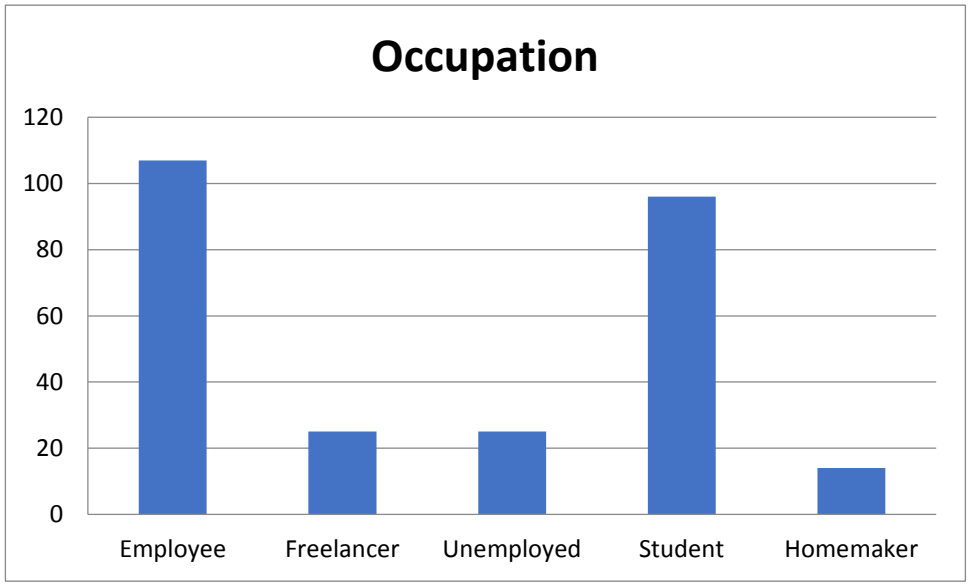

Figure 4.3.4. *Occupation*

4.4. User Experiences with Smartphone Voice Assistants

Since this research is about the use of smartphone voice assistants the brand is questioned.

4.4.1. Mobile phone brand used by the respondents

Table 4.4.1. *Mobile Phone Brand*

Characteristic		Frequency	Percentage
Brand	Apple	50	18.7
	Samsung	135	50.6
	Huawei	14	5.2
	Xiaomi	52	19.5
	Nokia	16	6.0

According to the table, Samsung has the highest frequency and percentage at 135 (50.6%), followed by Xiaomi at 52 (19.5%) and Apple at 50 (18.7%). Huawei and Nokia have lower frequencies and percentages at 14 (5.2%) and 16 (6.0%), respectively. Using the pie chart below, it is comfortable to communicate this information visually.

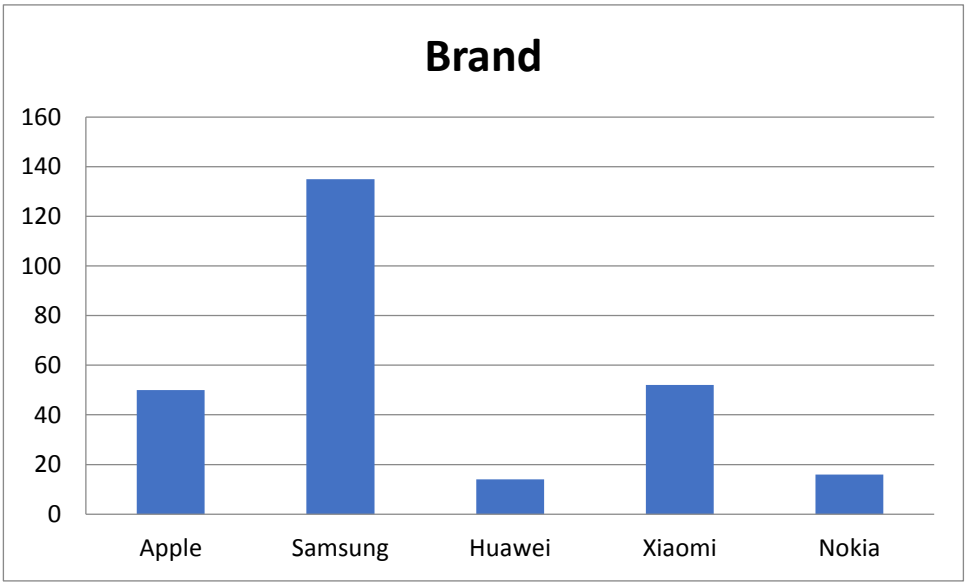

Figure 4.4.1. *Mobile Phone Brand Data*

4.4.2. Name of the Voice assistant used by the respondents in their mobile phones

Table 4.4.2. *Voice Assistant Brand Data*

Characteristic		Frequency	Percentage
Voice Assistant	Siri	50	18.7
	Google Assistant	171	64.0
	Bixby	31	11.6
	Celia	5	1.9
	Mi	10	3.7

The data suggests that among the listed voice assistant options, Google Assistant is the most commonly used with a percentage of 64.0%, followed by Siri at 18.7%, Bixby at 11.6%, Mi at 3.7%, and Celia at 1.9%. These findings indicate a clear preference towards

Google Assistant among mobile phone users, with the majority of participants opting for this voice assistant over others. The pie chart below, will provide visuality.

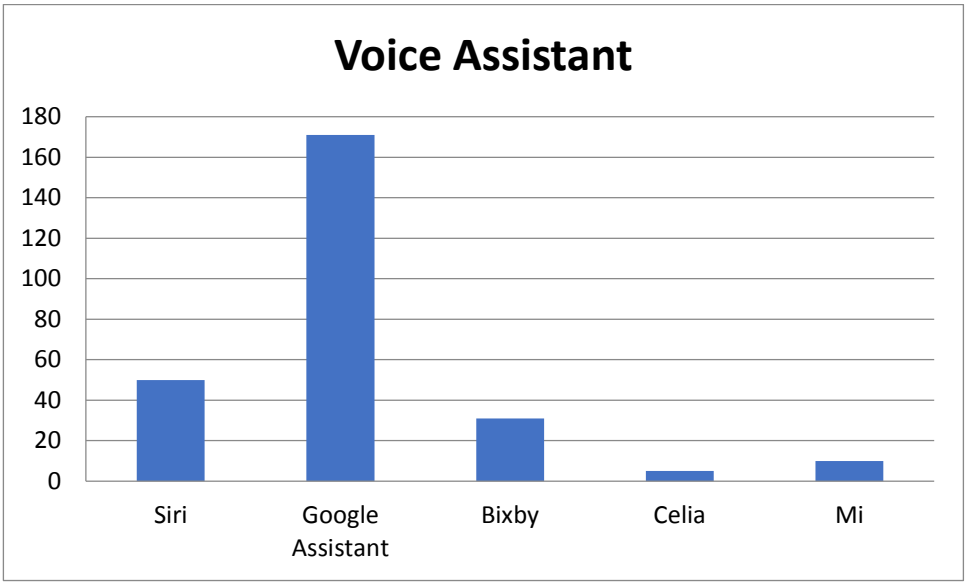

Figure 4.4.2. *Voice Assistant Brand*

4.5. Frequency of use

To answer the question, 'What is the level (frequency) of use of voice assistants?' we can refer to the following table:

Table 4.5. *Frequency of Use*

Characteristic		Frequency	Percentage
Frequency of Use	Almost every day	30	11.2
	A few times a month	92	34.5
	A few times or less in a year	144	54.3

The table provided presents data on the frequency of use for voice assistants on mobile phones. The table shows that a majority of users (54.3%) only use voice assistants a few times or less in a year. However, a significant portion of users (34.5%) use voice assistants a few times a month, while a smaller proportion of users (11.2%) use them almost

every day. These findings suggest that while voice assistants are becoming increasingly popular, they are not yet being used consistently by all users. Additionally, the frequency of use for voice assistants is shown in figure below:

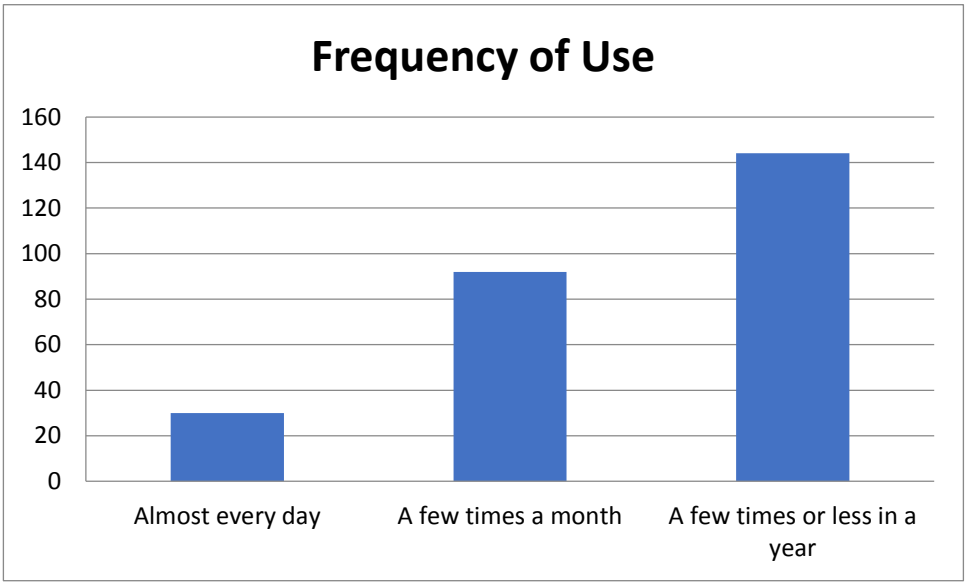

Figure 4.5. *Frequency of Use*

4.6. Importance of voice assistant availability on smart phone

To address the importance of voice assistant availability on smart phone, we can refer to the following table:

Table 4.6. *Importance of Voice Assistant Availability on Mobile Phone*

Characteristic		Frequency	Percentage
Importance of Voice assistant Availability on Smart Phone	Very Important	42	15.7
	Important	77	28.8
	Neither important nor not important	79	29.6
	Not Important	46	17.2
	Not important at all	23	8.6

According to the table below, it shows the frequency and percentage of customers' opinions on the importance of voice assistant availability on mobile phones when they want to purchase a mobile phone.

The data suggests that a majority of customers (44.5%) find voice assistant availability to be either very important or important when considering a new phone purchase. Additionally, almost a third of customers (29.6%) remain neutral on this feature's importance, while 25.8% of customers consider it to be not important or not important at all. Figure below shows the resalts visually.

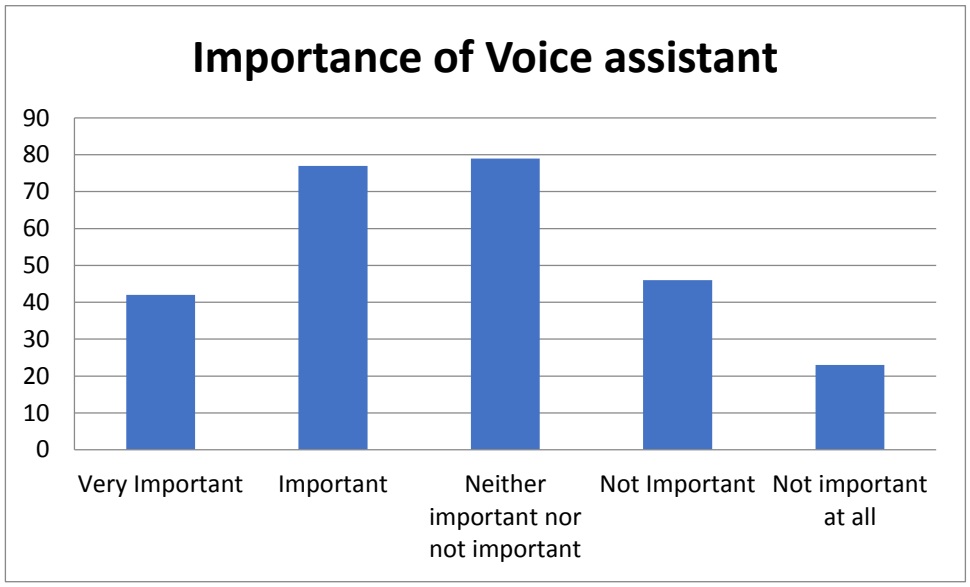

Figure 4.6. *Importance of Voice Assistant Availability on Mobile Phone*

5. FINDINGS ABOUT THE RELATIONSHIPS BETWEEN VARIABLES

To investigate the research questions, first Spearman correlation test has conducted to find out if there is significantly correlation between trust and privacy concern. And then to comprehend the impact of privacy concern, hedonic and utilitarian value, and trust on the intention to use of voice assistants, regression analysis has used. Additionally, Kruskal-Wallis Test and Mann-Whitney Test in order to understand the effect of demographic variables on the intention to use of voice assistants has conducted.

5.1. Relationship Between Trust and Privacy Concern

Since the variables were abnormally distributed based on our initial analysis, for the question "Is trust and Privacy concern correlated (When trust increases, does privacy concern decrease)? ", Spearman correlation was used. The result of investigating the relationship between Trust and Privacy Concern is shown in the table 5.1. The findings show a negative and significant correlation between Trust and Privacy Concern (r = -0.39).

Table 5.1. *Spearman Correlation Test*

		Privacy Concern
Trust	Correlation Coefficient	-.390**
	Sig. (2-tailed)	.000
	N	267

5.2. Effect of Privacy Concern on Intention to Use Voice Assistants

In order to investigate the effect of Privacy Concern on Intention to Use, a simple regression analysis is used. According to check the assumption of normality in the context of regression analysis, the normality of the residuals was examined. Figure 5.2. shows a scatterplot between the distribution of Privacy Concern on Intention to Use, it showed a normal distribution.

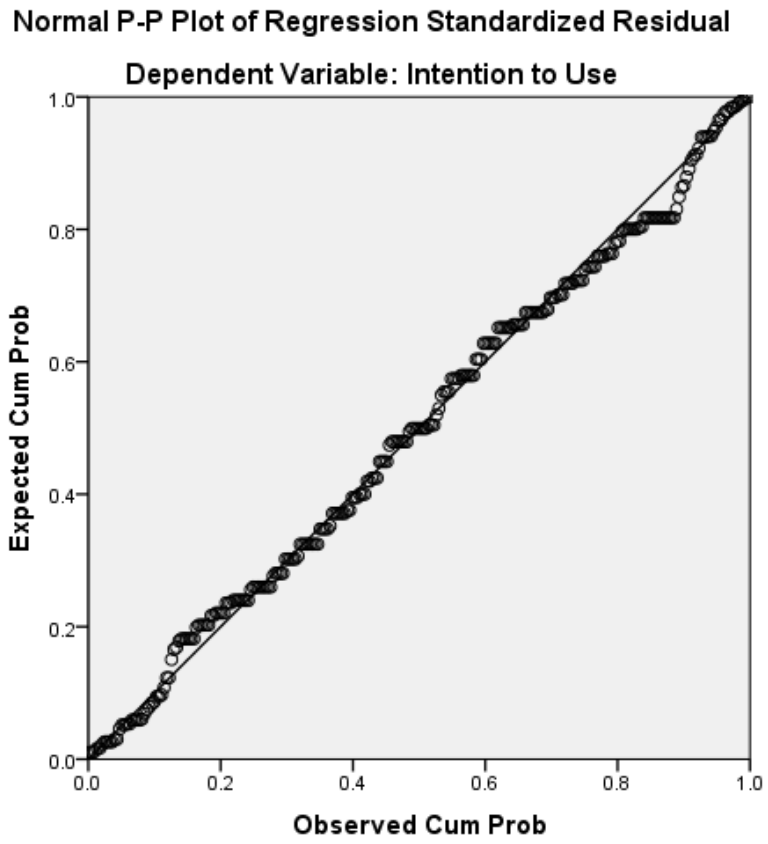

Figure 5.2. *Scatterplot between Privacy Concern on Intention to Use*

Table 5.2.1. provides the results of the analysis of variance (ANOVA) for a regression model. Based on the result, the regression model is found to be statistically significant (Sig = 0.000). This shows that the predictor variable, Privacy Concern, has significant effect on Intention to Use.

Table 5.2.1. *ANOVA table between Privacy Concern and Intention to Use*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.911	1	7.911	14.650	.000
	Residual	143.098	265	.540		
	Total	151.009	266			

The results in table 5.2.2. illustrates that privacy concerns have a statistically significant effect on Privacy Concern on Intention to Use (Sig = 0.000). Since the standardized coefficient (Beta) is -0.229, this affection is negative.

Table 5.2.2. *Coefficients table between Privacy Concern and Intention to Use*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.890	0.135		21.328	.000
	Privacy Concern	-.185	0.048	-.229	-3.828	.000

5.3. Effect of Utilitarian and Hedonic Benefits on Intention to Use

In order to answer the question, 'What is the effect of Utilitarian and Hedonic benefits on Intention to use of voice assistants?', a regression analysis is used. According to check the assumption of normality in the context of regression analysis, the normality of the residuals was examined. Figure 5.3. shows a scatterplot between the distribution of Utilitarian and Hedonic on Intention to Use, it showed a normal distribution.

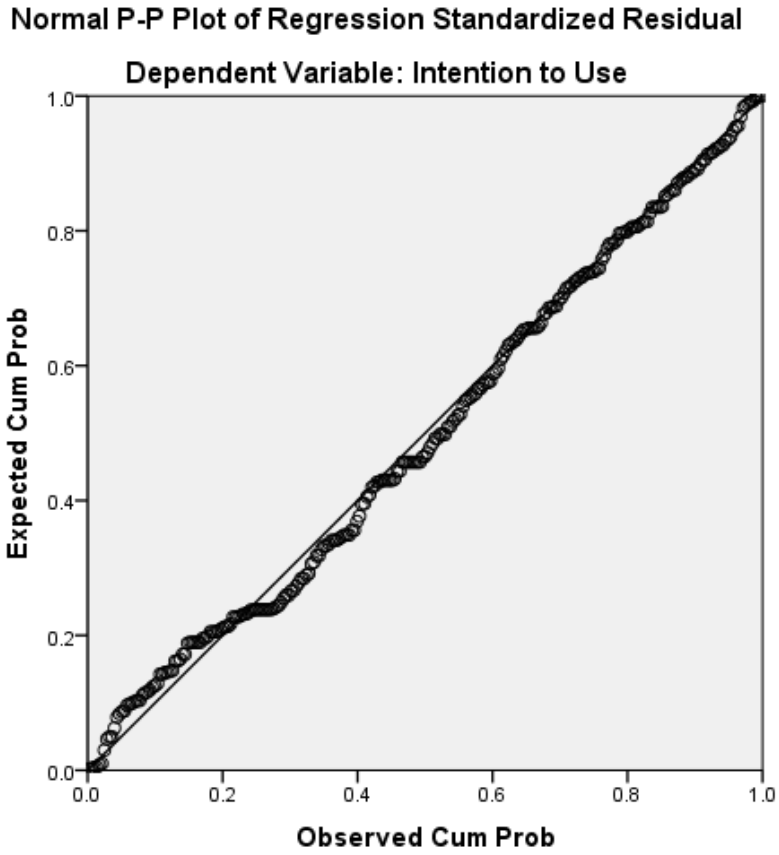

Figure 5.3. *Scatterplot between Utilitarian and Hedonic on Intention to Use*

Table 5.3.1. provides the results of the analysis of variance (ANOVA) for a regression model. Based on the result, the regression model is found to be statistically significant (Sig = 0.000). This shows that the predictor variables have significant effect on Intention to Use.

Table 5.3.1. *ANOVA table between Utilitarian and Hedonic and Intention to Use*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.392	2	39.696	146.331	.000
	Residual	71.617	264	.271		
	Total	151.009	266			

The results in table 5.3.2. illustrates significant effect of Utilitarian and Hedonic on Intention to Use (Sig = 0.000, Sig=0.000). Since the standardized coefficient (Beta) for Utilitarian and Hedonic are 0.574 and 0.249, these affections are positive. Based on the result, Utilitarian Benefit has a greater influence on Intention to Use, compared to Hedonic.

Table 5.3.2. *Coefficients table between Utilitarian and Hedonic and Intention to Use*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.528	.115		4.593	.000
	Utilitarian Benefit	.610	.051	.574	11.973	.000
	Hedonic Benefit	.233	.045	.249	5.201	.000

5.4. Effect of Privacy Concern, Hedonic and Utilitarian Value, and Trust on Intention to Use Voice Assistants

In order to answer the question, 'What is the effect of Privacy Concern, Hedonic and Utilitarian Value, and Trust on the intention to use of voice assistants?', a regression analysis is used. According to audit assumption of normality in context of regression, the normality of the residuals was examined. Figure 5.4. shows a scatterplot between the distribution of Privacy Concern, Hedonic and Utilitarian Value, and Trust on Intention to Use, it showed a normal distribution.

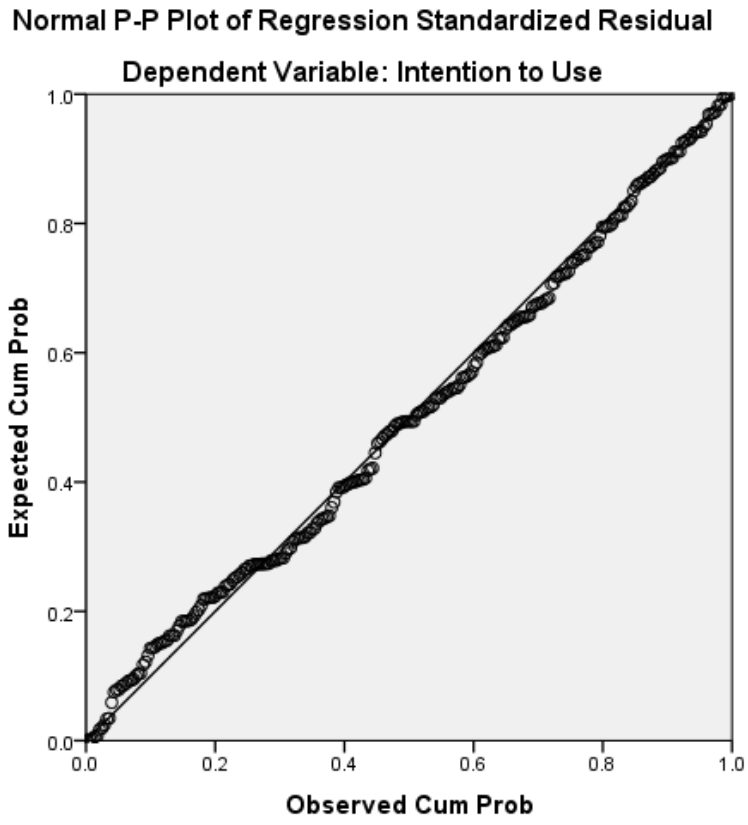

Figure 5.4. *Scatterplot among Privacy Concern, Hedonic and Utilitarian Value, and Trust on Intention to Use*

Table 5.4.1. provides the results of the analysis of variance (ANOVA) for a regression model. Based on the result, the regression model is found to be statistically significant (Sig = 0.000). This shows that the predictor variables have significant effect on Intention to Use.

Table 5.4.1. *ANOVA table between Privacy Concern, Hedonic and Utilitarian Value, and Trust and Intention to Use*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.507	4	21.377	85.505	.000
	Residual	65.502	262	.250		
	Total	151.009	266			

The results in table 5.4.2. illustrates significant effect of Privacy Concern, Hedonic and Utilitarian Value, and Trust on Intention to Use (in order, Sig = 0.016, 0.000, 0.000, 0.007). Since the standardized coefficient (Beta) for Privacy Concern, Hedonic and Utilitarian Value, and Trust in order are -0.112, 0.222, 0.526 and 0.136, the effect of Privacy Concern is negative and the effect of other predictors are positive. Based on the result, Utilitarian Benefit has the strongest effect on Intention to Use, compared to other predictors.

Table 5.4.2. *Coefficients table between Privacy Concern, Hedonic and Utilitarian Value, and Trust and Intention to Use*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.550	.202		2.722	.007
	Privacy Concern	-.090	.037	-.112	-2.427	.016
	Hedonic Benefit	.207	.043	.222	4.777	.000
	Utilitarian Benefit	.559	.051	.526	10.873	.000
	Trust	.143	.053	.136	2.721	.007

5.5. Effect of Demographic Variables on Intention to Use Voice Assistants

Since the variables were found to be abnormally distributed based on our initial analysis, non-parametric tests are used to answer the question, 'What is the effect of demographic variables on the intention to use?' To examine the effect of gender, the Mann-Whitney test is employed, while the Kruskal-Wallis test is used to examine the effect of age, education, and occupation.

All the statistical levels of the tests are greater than 0.05 and it can be said that none of the demographic variables have a significant effect on the intention to use statistically. However, considering that the significance levels of the test related to education is very close to 0.05, the effect of education on the intention to use can be considered almost significant. This means that the intention to use is more among participants with higher level of education. Based on the result, participants holding Bachelor, Master and PhD degrees have a higher level of the use of voice assistants, compared to people with lower education.

Table 5.5. *Effect of demographic characteristics on the intention to use*

demographic Characteristics		Mean Rank	Sig
Gender	Male	142.28	0.098[1]
	Female	126.82	
Age	15to20	109.06	0.081[2]
	21to30	134.91	
	31to40	148.65	
	41to50	133.14	
	51-and-older	135.75	
Education	High-school	108.09	0.063[2]
	Associate	116.35	
	Bachelor	141.30	
	Master	141.75	
	PhD	146.31	
Occupation	Employee	145.14	0.167[2]
	Freelancer	114.26	
	Unemployed	110.38	
	Student	132.31	
	Homemaker	137.93	

1. Mann-Whitney Test

2. Kruskal-Wallis Test

6. DISCUSSION AND CONCLUSION

This research has searched the influence of brand trust (trust in device), hedonic and functional value, and privacy concern on the use of voice assistants on the smartphones. Thus, following questions were investigated:

- What is the level of use of voice assistants?
- Is trust and privacy concern correlated?
- What is the effect of privacy concern on intention to use?
- How utilitarian and hedonic value affect the use of voice assistants?
- What is the effect of privacy concern, hedonic and utilitarian value, and trust on the intention to use of voice assistants?
- What is the effect of demographic variables on the intention to use?

The Figure 6.1 illustrates the relationship between the dependent and independent variables.

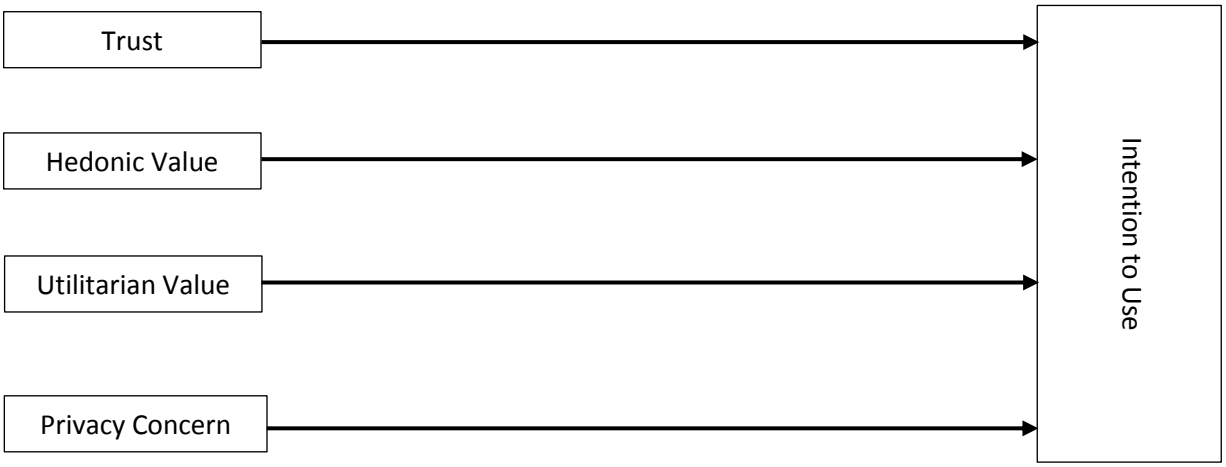

Figure 6.1. *Relationship between the dependent and independent variables*

Based on the result, a majority of users only use voice assistants a few times or less in a year. Still, a significant portion of users use voice assistants a few times a month, while a small-scale proportion of users use them almost every day. These findings declare that while voice assistants are becoming increasingly popular, they are not yet being used consistently by all users.

Also result shows that a majority of customers find voice assistant accessibility to be either very important or important when considering a new phone purchase. In addition, almost a third of customers remain indifferent on this feature's importance.

This research investigated the relationship between trust and privacy concern. The findings showed a negative correlation between trust and privacy concern. That means by increasing trust, privacy concerns will be decreased. Additionally, privacy concern had a negative impact on the intention to use. It shows the importance of addressing privacy concerns to boost user adoption and acceptance of voice assistants. Hasan et al. (2012) asserts that perceived risk seems to have a significantly negative influence on brand loyalty.

The regression analysis to investigate the impact of privacy concern on the use of voice assistants reveals a negative effect. According to Chen and Li (2017) research, privacy concerns have a substantial impact on tendency to use mobile devices and software such as voice assistants.

Utilitarian and hedonic value have significant effect on intention to use, so that utilitarian benefit showed a stronger effect. This advises that users regard voice assistants as valuable tools for practical goals, such as information recovery and task completion. However, the hedonic aspect, related to activity and amusement, also gives to users' intention to use voice assistants.

The combined analysis of privacy concern, utilitarian and hedonic value, and trust illustrated their impact on the intention to use voice assistants, with utilitarian benefit having the strongest effect. The regression analysis showed that all these factors have a significant impact on the intention to use. Privacy concern presented a negative effect, while utilitarian value, hedonic value, and trust showed positive effects. Among these factors, utilitarian benefit had the strongest effect on the intention to use. These findings express the importance

of pointing privacy concerns, improving perceived value, and promoting trust to increase the adoption and usage of voice assistants.

Demographic variables did not significantly influence the intention to use, however education almost had an effect on the intention to use. In other words, the intention to use is more among participants with higher level of education. This suggested that education has a role in shaping users' acceptance and usage of voice assistants, with persons holding Bachelor, Master, and PhD degrees showing a higher level of usage. Overall, the findings of this study show worthy insights for professional person and researchers in the field of voice assistants. They highlight the value of building trust, pointing privacy concerns, and presenting both utilitarian and hedonic value to encourage user adoption.

By comprehending the effects of brand trust, hedonic and functional value, and privacy concerns on the use of voice assistants on mobile phones, businesses can leverage this tool to improve consumer engagement, gaining benefit from the highest adoption of voice assistants. The findings show that despite the increasing popularity of voice assistants, their usage is inconsistent among all users. Addressing privacy concerns, providing trust, and increasing the practical benefits of voice assistants are crucial for boost adoption.

Additionally, targeting higher education users and emphasizing accessibility can improve user engagement. Businesses should focus on balancing utilitarian and hedonic value to provide a better user experience. Monitoring user adoption and conducting research during the time to understand user preferences are recommended.

6.1. Limitations and Suggestions for Future Research

This study focused on mobile phone users who use voice assistants and investigated the effect of brand trust, hedonic and functional value, and privacy concerns on their usage. However, voice assistants on other intelligent devices such as in home smart voice assistants have not been investigated. Thus, future studies could examine the use of different kind of voice assistants.

Additionally, due to the fact that the data for this study were collected in Iran, the findings can be evaluated within the framework of Iran. The sample represents the portion of the population with a higher level of education, which can be considered a study limitation, that future researches might use alternative sampling methods. Moreover, in the present study, the effect of demographic variables including gender, age, education and occupation on the intention to use voice assistants has been investigated. Future studies could examine other factors like introversion, extroversion, and income that may also impact the usage of voice assistants.

Considering how cultural factors impact acceptance and utilization of voice assistants would provide a broader perspective and a more general understanding, future research should consider cultural and contextual factors. Furthermore, combining quantitative and qualitative methods could provide a more comprehensive perceptive of users' experiences with voice assistants. Qualitative data, such as interviews or focus groups, could give rich insights into users' motivations, interests, and usage patterns.

REFERENCES

Agrawal, A., Gans, J., & Goldfarb, A. (2018). Google's AI assistant is a reminder that privacy and security are not the same. *Harvard Business Review*.

Ammari, T., Kaye, J., Tsai, J. Y., & Bentley, F. (2019). Music, Search, and IoT: How People (Really) Use Voice Assistants. *ACM Trans. Comput. Hum. Interact.*, *26*(3), 17:11-17:28.

Assael, H. (1998). Consumer behavior and marketing action, 6th. *Cincinnati, OH: South-Western Pub*.

Bansal, G. (2017). Distinguishing between privacy and security concerns: An empirical examination and scale validation. *Journal of Computer Information Systems*, *57*(4), 330-343.

Bao, W., Ni, J., & Singh, S. (2018). Informal lending in emerging markets. *Marketing Science*, *37*(1), 123-137.

Berezina, K., Ciftci, O., & Cobanoglu, C. (2019). Robots, artificial intelligence, and service automation in restaurants. In *Robots, artificial intelligence, and service automation in travel, tourism and hospitality*. Emerald Publishing Limited.

Brill, T. M., Munoz, L., & Miller, R. J. (2019). Siri, Alexa, and other digital assistants: a study of customer satisfaction with artificial intelligence applications. *Journal of Marketing Management*, *35*(15-16), 1401-1436.

Buhalis, D., & Moldavska, I. (2021). In-room voice-based AI digital assistants transforming on-site hotel services and guests' experiences. Information and Communication Technologies in Tourism 2021: Proceedings of the ENTER 2021 eTourism Conference, January 19–22, 2021,

Corritore, C. L., Kracher, B., & Wiedenbeck, S. (2003). On-line trust: concepts, evolving themes, a model. *International journal of human-computer studies*, *58*(6), 737-758.

Dagli, M. (2018). *Designing for Trust: Exploring Trust and Collaboration in Conversational Agents for E-commerce* Master's thesis. School of Design, Carnegie Mellon University].

Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, *48*, 24-42.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Deighton, J. (1992). The consumption of performance. *Journal of consumer research*, *19*(3), 362-372.

Dinev, T., Albano, V., Xu, H., D'Atri, A., & Hart, P. (2016). Individuals' attitudes towards electronic health records: A privacy calculus perspective. *Advances in healthcare informatics and analytics*, 19-50.

Ekelund, C. (2003). The impact from trust on relationship commitment: a study of standardized products in mature industrial markets.

Falcone, R., & Castelfranchi, C. (2001). Social trust: A cognitive approach. *Trust and deception in virtual societies*, 55-90.

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, *59*(4), 451-474.

Gardiner, B. (2018). Private smarts: Can digital assistants work without prying into our lives?-scientific American. *Visitado a*, *11*.

Graaf, M., & Malle, B. (2017). How people explain action (and autonomous intelligent systems should too). AAAI Fall Symposia. In.

Hasan, R., Shams, R., & Rahman, M. (2021). Consumer trust and perceived risk for voice-controlled artificial intelligence: The case of Siri. *Journal of Business Research*, *131*, 591-597.

Haug, M., Rössler, P., & Gewald, H. (2020). How users perceive privacy and security risks concerning smart speakers.

Healey, J. (Ed.). (2020). *Artificial Intelligence* (Vol. 450). The Spinney Press.

Hoy, M. B. (2018). Alexa, Siri, Cortana, and more: an introduction to voice assistants. *Medical reference services quarterly*, *37*(1), 81-88.

hso. (2018). *Voice-activated shopping: a fad, or the future of retail?* https://www.hso.com/blog/voice-activated-shopping-a-fad-or-the-future-of-retail

Hu, Y., & Min, H. K. (2023). The dark side of artificial intelligence in service: The "watching-eye" effect and privacy concerns. *International Journal of Hospitality Management*, *110*, 103437.

Jones, V. K. (2019). *Experiencing voice-activated artificial intelligence assistants in the home: A phenomenological approach* The University of Nebraska-Lincoln].

Karjaluoto, H., Karvonen, J., Kesti, M., Koivumäki, T., Manninen, M., Pakola, J., Ristola, A., & Salo, J. (2005). Factors affecting consumer choice of mobile phones: Two studies from Finland. *Journal of Euromarketing*, *14*(3), 59-82.

Kim, D., & Hwang, Y. (2006). A study of mobile internet usage from utilitarian and hedonic user tendency perspectives. *AMCIS 2006 Proceedings*, 251.

Kiseleva, J., & de Rijke, M. (2017). Evaluating personal assistants on mobile devices. *arXiv preprint arXiv:1706.04524*.

López, G., Quesada, L., & Guerrero, L. A. (2017). Alexa vs. Siri vs. Cortana vs. Google Assistant: a comparison of speech-based natural user interfaces. International conference on applied human factors and ergonomics,

Malkin, N., Deatrick, J., Tong, A., Wijesekera, P., Egelman, S., & Wagner, D. (2019). Privacy attitudes of smart speaker users. *Proceedings on Privacy Enhancing Technologies*, *2019*(4), 250-271.

Malodia, S., Islam, N., Kaur, P., & Dhir, A. (2021). Why do people use Artificial Intelligence (AI)-enabled voice assistants? *IEEE Transactions on Engineering Management*.

Martin, K. (2018). The penalty for privacy violations: How privacy violations impact trust online. *Journal of Business Research*, *82*, 103-116.

Maubisson, L., & Riviere, A. (2021). More value for more satisfaction? The moderating role of the consumer's accumulation of experience. *Recherche et Applications en Marketing (English Edition)*, *36*(1), 5-43.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of management review*, *20*(3), 709-734.

Mcknight, D. H., Carter, M., Thatcher, J. B., & Clay, P. F. (2011). Trust in a specific technology: An investigation of its components and measures. *ACM Transactions on management information systems (TMIS)*, *2*(2), 1-25.

McLean, G., & Osei-Frimpong, K. (2019). Hey Alexa… examine the variables influencing the use of artificial intelligent in-home voice assistants. *Computers in Human Behavior*, *99*, 28-37.

McLean, G., Osei-Frimpong, K., & Barhorst, J. (2021). Alexa, do voice assistants influence consumer brand engagement?–Examining the role of AI powered voice assistants in influencing consumer brand engagement. *Journal of Business Research*, *124*, 312-328.

Michell, P., Reast, J., & Lynch, J. (1998). Exploring the foundations of trust. *Journal of Marketing Management*, *14*(1-3), 159-172.

Miller, T. (2019). Explanation in artificial intelligence: Insights from the social sciences. *Artificial intelligence*, *267*, 1-38.

Mishra, A., Shukla, A., & Sharma, S. K. (2022). Psychological determinants of users' adoption and word-of-mouth recommendations of smart voice assistants. *International Journal of Information Management*, *67*, 102413.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Pal, D., Arpnikanondt, C., Razzaque, M. A., & Funilkul, S. (2020). To trust or not-trust: privacy issues with voice assistants. *IT Professional*, *22*(5), 46-53.

Perez Garcia, M., & Saffon Lopez, S. (2018). Building trust between users and telecommunications data driven virtual assistants. Artificial Intelligence Applications and Innovations: 14th IFIP WG 12.5 International Conference, AIAI 2018, Rhodes, Greece, May 25–27, 2018, Proceedings 14,

Robinson, C. (2017). Disclosure of personal data in ecommerce: A cross-national comparison of Estonia and the United States. *Telematics and Informatics*, *34*(2), 569-582.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of management review*, *23*(3), 393-404.

Rzepka, C. (2019). Examining the use of voice assistants: A value-focused thinking approach.

Sağkaya Güngör, A., & Ozansoy Çadırcı, T. (2022). Understanding digital consumer: A review, synthesis, and future research agenda. *International Journal of Consumer Studies*, *46*(5), 1829-1858.

Sas, C., & Khairuddin, I. E. (2017). Design for trust: An exploration of the challenges and opportunities of bitcoin users. Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems,

Setyawan, A. A., & Kussudiyarsana, I. (2015). Brand trust and brand loyalty, an empirical study in Indonesia consumers. *British Journal of Marketing Studies*, *4*(3), 37-47.

Sikarwar, S. S. (2022). AI BASED VOICE ASSISTANT.

Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: an interdisciplinary review. *MIS quarterly*, 989-1015.

Stephens, K. (2021). *Telecom is Dialing in Voice Assistants for Superior Customer Service*. https://www.soundhound.com/voice-ai-blog/telecom-is-dialing-in-voice-assistants-for-superior-customer-service/

Theuri, J., & Olukuru, J. (2022). *The impact of Artficial Intelligence and how it is shaping banking*.

Tulshan, A. S., & Dhage, S. N. (2019). Survey on virtual assistant: Google assistant, siri, cortana, alexa. International symposium on signal processing and intelligent recognition systems,

Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS quarterly*, 695-704.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178.

Vimalkumar, M., Sharma, S. K., Singh, J. B., & Dwivedi, Y. K. (2021). 'Okay google, what about my privacy?': User's privacy perceptions and acceptance of voice based digital assistants. *Computers in Human Behavior*, *120*, 106763.

Wagner, K., Nimmermann, F., & Schramm-Klein, H. (2019). Is it human? The role of anthropomorphism as a driver for the successful acceptance of digital voice assistants. proceedings of the 52nd Hawaii international conference on system sciences,

Wei, R. (2008). Motivations for using the mobile phone for mass communications and entertainment. *Telematics and Informatics*, *25*(1), 36-46.

Wolbers, K. O., & Walter, N. (2021). Silence Is Silver, but Speech Is Golden: Intelligent Voice Assistants (IVAs) and Their Impact on a Brand's Customer Decision Journey with a Special Focus on Trust and Convenience-A Qualitative Consumer Analysis in the Netherlands. *IUP Journal of Brand Management*, *18*(1).

Xu, H., Dinev, T., Smith, H. J., & Hart, P. (2008). Examining the formation of individual's privacy concerns: Toward an integrative view.

Xu, S., & Li, W. (2022). A tool or a social being? A dynamic longitudinal investigation of functional use and relational use of AI voice assistants. *New Media & Society*, 14614448221108112.

Flavián, C., Akdim, K., & Casaló, L. V. (2023). Effects of voice assistant recommendations on consumer behavior. *Psychology & Marketing*, *40*(2), 328-346.

Nazir, S., Khadim, S., Asadullah, M. A., & Syed, N. (2023). Exploring the influence of artificial intelligence technology on consumer repurchase intention: The mediation and moderation approach. *Technology in Society*, *72*, 102190.

Al Shamsi, J. H., Al-Emran, M., & Shaalan, K. (2022). Understanding key drivers affecting students' use of artificial intelligence-based voice assistants. *Education and Information Technologies*, *27*(6), 8071-8091.

Arsham, H. (2005). Questionnaire design and surveys sampling. *University of Baltimore*, *114*.

Fernandes, T., & Oliveira, E. (2021). Understanding consumers' acceptance of automated technologies in service encounters: Drivers of digital voice assistants adoption. *Journal of Business Research*, *122*, 180-191.

Jain, S., Basu, S., Dwivedi, Y. K., & Kaur, S. (2022). Interactive voice assistants–Does brand credibility assuage privacy risks? *Journal of Business Research*, *139*, 701-717.

Lietz, P. (2010). Research into questionnaire design: A summary of the literature. *International journal of market research*, *52*(2), 249-272.

Williams, M. A. (2019, June). The artificial intelligence race: Will Australia lead or lose? In *Journal and Proceedings of the Royal Society of New South Wales* (Vol. 152, No. 471/472, pp. 105-114).

George, A., & Walsh, T. (2022). Artificial intelligence is breaking patent law. Nature, 605(7911), 616-618.

APPENDIX

Questionnaire

Section One						
1	Do you have a smartphone with a voice assistant?	Yes☐ No☐				
2	Which brand do you use?	Apple☐ Samsung☐ Huawei☐ Xiaomi☐ Nokia ☐				
3	Have you ever used a voice assistant on your phone?	Yes ☐ No ☐				
4	Which voice assistant do you use?	Siri☐ Google Assistant ☐ Bixby☐ Celia☐ Mi☐				
5	How frequently do you use the voice assistant on your smart phone?	Almost every day ☐ A few times in a month ☐ A few times or less in a year ☐				
6	How important is it for you to have a voice assistant if you were to buy a new smart phone?	Very important☐ Important☐ Neither important nor not important☐ Not important☐ Not importance at all☐				
Section Two						
		Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
7	Interacting with voice assistant is useful.					
8	Voice assistant simplifies my life.					
9	Voice assistant makes time management easy.					
10	Using voice assistant is practical (I don't have to touch screen).					
11	Using the voice assistant enables me to navigate (browse) quickly.					
12	Voice assistant is exciting.					
13	Voice assistant is interesting.					
14	Interacting with voice assistant is fun.					

15	Voice assistant is entertaining.					
16	Voice assistant is enjoyable.					
17	I am hesitant to conduct a transaction involving money through the voice assistant.					
18	My concern is that my confidential information stored by the voice assistant could be hacked.					
19	I have become worried that the voice assistant accumulates an excessive amount of data about me.					
20	I am concerned that voice assistant technology may acquire my personal data without my permission.					
21	Voice assistants are trustworthy.					
22	I think voice assistants are reliable.					
23	I believe the virtual assistant provides honest information.					
24	I trust my smart phone brand.					
25	My smart phone is an honest brand.					
26	My smart phone is safe.					
27	In the future, I will utilize my voice-based assistant.					
28	I plan to utilize my voice-activated assistant often.					
29	I plan to continue utilizing the voice assistant as opposed to discontinuing its use.					

Section Three		
30	Age	15 to 20 years old ☐ 21 to 30 years old ☐ 31 to 40 years old ☐ 41 to 50 years old ☐ 51 years or older☐
31	Gender	Male☐ Female☐
32	Occupation	Employee☐ Self-employed/Freelance☐ Unemployed☐ Student☐ Retired☐ Home-maker☐
33	Level of education	High school diploma☐ Associate degree☐ Bachelor's degree☐ Master degree☐ Doctoral degree☐